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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,855	07/18/2003	Amitay Levi	2102397-992720	2925
26379	7590	12/14/2004	EXAMINER	
GRAY CARY WARE & FREIDENRICH LLP 2000 UNIVERSITY AVENUE E. PALO ALTO, CA 94303-2248			NGUYEN, CUONG QUANG	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/622,855	Applicant(s) LEVI ET AL.	
	Examiner Cuong Q Nguyen	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 9-13 and 24-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 14-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>04-21-04</u> & <u>08-03-04</u> | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Election/Restriction***

1. Applicant's election without traverse of Embodiment 1 (Fig.1a to Fig.1b and Fig.3a to Fig.3k and Fig.4) is acknowledged. Claims 1-8 and 14-23 read on the elected Embodiment, so claims 9-13 and 24-28 are withdrawn from consideration.

### **Claim Rejections - 35 USC § 103**

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 and 14-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsieh (US 2004/0087084) in view of Sung et al. (US 6,331,721).

Regarding claims 1, 2, Hsieh discloses a non-volatile memory cell comprising: a p-type silicon substrate (110); a n-type first region (154) and a n-type second region (226) formed in the substrate; a channel region formed between first and second regions, the channel region having a first portion close to the first region and a second portion close to the second region; a control gate (190) insulated from the second portion of the channel region; a floating gate (166) adjacent to the control gate and insulated

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therefrom, and insulated from the first portion of channel region, floating gate having a tip adjacent to the control gate; an erase gate (208) insulated from the control gate and the tip of the floating gate; an insulating material (204) between tip and erase gate permitting charges to tunnel from the tip to the erase gate (lines 1-7 col.1 of page 5).

See Hsieh's Fig.16B.

Hsieh does not explicitly teach that the silicon substrate is a single crystalline silicon substrate.

It is conventional and also taught by Sung et al. (col.5b lines 1-6) that a single crystalline silicon material is art recognized material for forming the substrate in the semiconductor memory device because it is convenient and available in the semiconductor field.

So, it would have been obvious to one of ordinary skill in the art to form the substrate of single crystalline silicon as taught by Sung et al. into Hsieh's device.

Regarding claim 3, as shown in Hsieh's Fig.16B, the substrate (110) has a substantially planar surface and wherein first and second regions and channel region are along the planar surface.

Regarding claim 4, Hsieh teaches that the insulating material is silicon oxide (lines 13-19 col.2 of page 4) which is known in the art as silicon dioxide.

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Regarding claim 5, Hsieh teaches the floating gate is insulated from the planar surface by a layer (114) of silicon oxide (lines 18-23 col.2 of page 2) which is known in the art as silicon dioxide.

Regarding claim 6, Hsieh teaches the floating gate is insulated from the control gate by a layer (174) of nitride (lines 43-48 col.2 of page 3) which is known in the art as silicon nitride.

Regarding claim 7, Hsieh teaches the control gate is insulated from the planar surface by a layer (174) of silicon oxide (lines 43-48 col.2 of page 3) which is known in the art as silicon dioxide.

Regarding claim 8, as shown in Hsieh's Fig.16B, the floating gate is capacitively coupled to the first region.

Regarding claims 14-22, as shown in Hsieh's Fig.16B, the cells in the same row have their first regions (154) connected together.

Regarding claim 23, as shown in Hsieh's Fig.16A, the cells in the same column have their control gate (the wordline) connected together and have erase gates connected together.

### **Conclusion**

3. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must

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conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 872-9306. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

4. Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to CUONG Q NGUYEN whose telephone number is (571) 272-1661. The Examiner is in the Office generally between the hours of 6:30 AM to 5:00 PM (Eastern Standard Time) Monday through Thursday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Eddie Lee who can be reached on (571) 272-1732.



Cuong Nguyen

Primary examiner

11/29/04